

The Design and Implementation of a Picklist Authoring Tool

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It is well recognized that controlled medical terminologies play a critical role in Health Information Systems and Clinical Patient Record systems, but the creation and management of customized lists of terms ("picklists") remains a potential obstacle. We have been developing a sophisticated authoring tool that is fully integrated with our terminology server and that will be made available to our system analysts and clinicians.

Background

An obstacle to the implementation of controlled medical terminologies in structured data entry applications is to provide clinicians with the terms they prefer to use within their working contexts, while at the same time standardizing the meanings of the concepts linked to these terms. A common strategy today is to create predefined data entry templates which use “picklists” to restrict the set of allowed terms. In this context, picklists can be thought of as customized views of a domain.

Currently at IHC, the picklists are dynamically created from three different tables of the Healthcare Data Dictionary¹ (HDD). This process causes performance problems, and induces the misuse of semantic relationships that exist between concepts. For example, the “*Has_Member*” relationship is being used to exclude unwanted concepts from a picklist. We have recently begun redesigning the HDD to implement picklists as precompiled structures. Retrieval of the picklists by applications will be quicker, and the “*Has_Member*” relationship can be restored to its proper use. Other characteristics of the new picklists, such as multiple level hierarchies, will help application users quickly locate their preferred terms. On the other hand, these changes will also lead to greater complexity of the picklists, and a software tool to facilitate and validate the creation and maintenance of picklists is required. The tool will also act as a bridge for users who do not have editing permissions for the HDD, enabling them to manipulate HDD terms to create their own picklists and propose them to the vocabulary engineers. The picklists will then be reviewed and activated in the HDD.

The Picklist Authoring Tool

The picklist authoring tool (PLAT) is being created in Java with a user-friendly graphical interface (Figure 1). The access to the HDD will rely on terminology middleware services written in EJB. With this strategy, the interface design and the business logic to query the HDD tables will be kept independent. It displays the hierarchy of the domain selected by the user with all its related concepts in a tree-like view, with concepts as “nodes” and terms as “leaves.” The user can navigate the whole tree and choose his or her preferred terms. If the user creates a hierarchical picklist, the selected terms will also be displayed as a tree, otherwise, they will be displayed as a flat list. The user can manipulate the created picklist by changing the order of the picklist entries, or by deleting an entry. Most importantly, if the picklist is hierarchical, PLAT will automatically maintain the integrity of the hierarchy while the user inserts or deletes picklist entries.

PLAT will be used to both create new picklists and maintain existing picklists. When any new concepts or representations are added to the HDD, or when any concepts or representations get replaced or become obsolete, there will be triggers in the HDD to update the picklist tables. Picklist authors will be notified of the modifications. When PLAT users update or modify an existing picklist, the changes introduced by the triggers will be differentiated by different colors. The design of PLAT has been achieved by group discussions among picklist users who considered the usability and functionality that the tool should provide. Also, the design will be gracefully evolved during the testing of the PLAT prototypes.

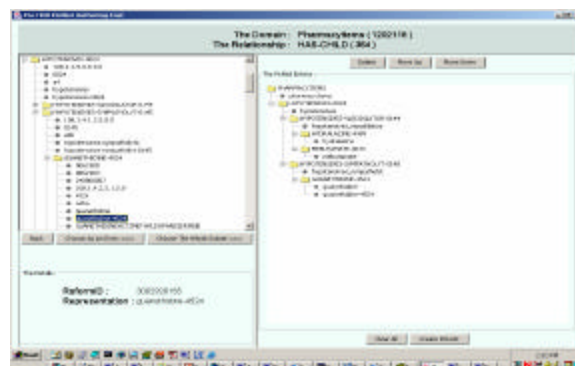


Figure 1. The picklist authoring tool user interface

¹http://www.3m.com/us/healthcare/his/products/recorders/data_dictionary.ihtml